# THE QUAVER,

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A monthly Advocate of Popular Musical Education,

And Exponent of the Letter-note Method.

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THE

# LETTER-NOTE METHOD,

An easy System which

## TRAINS TO SING AT SIGHT

FROM THE ORDINARY NOTES.

Its Tenets are these:—

1. That METHOD involves a careful Graduation of the lessons, a thorough Treatment of every point studied, and an Elucidation of Principles as well as Facts.

2. That the STAFF-NOTATION, taking it all round, is the BEST yet invented affording peculiar advantages to the PLAYER, and also to the SIGHT-SINGER who understands his work.

3. That the best systems of sight-singing are those founded upon the TONIC DO principle, because the KEY is a mere accident, but the SCALE is the TUNE, and it is by the relation which the sounds bear to the Tonic and to each other (not by their pitch upon the Stave) that the Vocalist sings.

4. That the easiest possible mode of teaching on this principle is that termed LETTER-NOTE, which appends the Sol-fa initials to the ordinary notes, and either withdraws the letters gradually, or otherwise trains the pupil to dispense with their aid.

5. That Letter-note provides the most direct INTRODUCTION possible to the staff notation, because the Pupil is trained from the OUTSET by means of the symbols employed in that notation.

6. That Letter-note, while it is legible by every Player, gives the Singer all the AID derivable from a specially contrived notation.

7. That the assistance of Letter-note in learning to sing is as LEGITIMATE and ADVANTAGEOUS as the "fingering" printed for the use of the Pupil-pianist.

8. That, although the habitual use of Letter-note is quite unnecessary to the matured Sight-singer, it increases the reading power of the YOUTHFUL and the UNSKILLED, enabling them to attain an early familiarity with a better class of music, and thus cultivating a higher musical taste.

## The Pioneers of the Singing Movement.—*(Continued from No. 48).*

### J. J. Waite.

WAITE may fairly be described as THE Psalmodist, for it was by his instrumentality and through him primarily, that the psalmody revolution of thirty years ago was effected. It was about the year 1850 that Waite, then dissenting minister at Ilminster, carried to he metropolis the Gospel of good music for he Chapel, and so well did he accomplish is work that within a very few years the /hole system of Nonconformist psalmody vas remodelled, renovated, and improved—e-created, in fact. Previous to this date, such unes as "Devizes," "Lydia," "Cranbrook," 'Burnham," etc.—a florid, repeating, and ıguing class of tune, now almost extinct—ere in universal use, and not in use merely, ut in downright abuse; for, until Waite lifted p his voice in protest, it was quite customary ɔ sing such tunes to any hymn of their own metre, without so much as a thought as to whether the word or line which the tune necessarily repeated would bear such repetition without becoming nonsensical. But, so telling and truthful were Waite's strictures upon prevailing customs, so persuasive his eloquence in favour of "intelligent" congregational singing, and so convincing his practical lessons to the congregational singers themselves, that the "new views" carried everything before them; Cranbrook, Burnham, & Co. were discovered to be nuisances and crying evils, and their upholders old fogies and bores,—things and persons to be cut up, put down, or made away with by any means possible. It was just about this time that psalmody lecturers began to employ those stock anecdotes (whether real occurrences or events made to order, is uncertain) relating how a given hymn was sung to a stated tune which necessitated such an exhibition as this:—

"Send down sal—send down sal—send down salvation."

Or this:—

"And more eggs—more eggs—more eggs—more exalted strains."

ut what with Waite's ponderous artillery in he shape of lectures and monster singing lasses, and what with the light dropping fire of he pasquinaders, the old tunes were speedily attered out of recognition and out of existence, or nearly so, for probably there are very ew chapels or churches in the kingdom where hey can still be heard.

Now, although ready to admit that Waite nd other reformers were quite right in their ode of procedure—because a great and long-tablished evil had to be remedied, for which nly a drastic purge was effectual—we are not repared to assert that the change has been n unmixed good: we have gained in some espects, but have lost in others. We have ertainly gained a purer, better, more intelli-ent and devotional rendering of the hymns, ut we have at the same time lost some of the ervour and vigour of former days. According o our view, when the old tunes were dis-tablished, something else, securing similar dvantages but without their objectionable features, should have been introduced to fill up the gap. The associations connected with those tunes were dear to the people; their style appealed directly to the *feelings* of the singers of that day, carrying home to their very hearts the sentiments of the words sung; and although the musician might term them "trash" and "vulgarity," they nevertheless had the property of drawing out the voice of the great congregation in a way which it was a real treat to listen to. This they effected by the liveliness and motion of their melody, by the little points of interest afforded the singers through the entry and re-entry of the various voice-parts, and by the repetitions of words or sentences—not "vain repetitions" when suitable hymns were chosen, but such as would tend by their iteration to heighten and deepen the impressions made by the words. To illustrate our meaning, suppose a hymn in which each verse has a "burden" which is the same in all, and that the setting of the music repeats it thus:—

*(Treble).* "The year of Jubilee is come,.....The year of Jubilee is come,
*(Bass).* "The year of Jubilee is come,
*(All).* Return, *(pause).* Return, ye ransomed sinners, home."

Or thus; although, the specimen is 200 years old, and scarcely up to the modern standard f elegance:—

*(Treble).* "For certainly his mercies 'dure.....For certainly his mercies 'dure,"
*(Bass).* For certainly his mercies 'dure
*(All).* Most firm, *(pause).* Most firm and sure eternally."

And suppose, further, that a large congregation, numbering its thousands, able to render the music efficiently either by ear or by note, and having just listened to a rousing sermon delivered by some energetic preacher, rise to sing either of these as the concluding hymn of the evening service. The preceding portion of the verse having been sung straight through by the full strong voice of the whole congregation, the soft clear tones of the females, like sounds from heaven, tell of God's enduring mercy; before they have finished this line, the answer of the men's deep voices comes like an earthly echo; once more the females sing their strain, but in a higher key, as if to emphasize the first assertion; a momentary silence, and the whole congregation unite in a tremendous unison on the words "Most firm"; another dead silence, and then the words are repeated in full harmony, and so on to the end of the line, with a vigour and emphasis which prove that the singers thoroughly feel what they utter. Thus, partly through the sermon and appropriateness of the hymn to the subject, and partly through the tune—the contrast and emulation of the parts, the antiphonal delivery, and the emphatic repetition of the words, which sends the idea home to every mind and clinches them there—the result is a heart-poured hymn of praise, a spontaneous burst of music, a general shout of joy and thanksgiving which do one good to participate in or to listen to.

Do not mistake our meaning, however: we are not arguing for the restoration of Burnham, Cranbrook and Co., for possibly these tunes might wholly fail either to please or to profit a modern congregation. But what we do argue for is this: that instead of adopting "rest and be thankful" as our motto, we proceed farther and carry out the reform to its legitimate consequences, these consequences being the total abolition of the still-prevailing practice of singing any hymn to any tune of its own metre and cast of sentiment—a proceeding never adopted in secular music except the commonest class—and the substitution therefor of anthem-tunes or sacred part-songs, *i.e.* tunes sung to their own hymn only, which hymn they fit as a glove does the hand of its wearer. It is evident that, if this arrangement were adopted, there could no risk of our psalmody being marred by the abuse which Waite exposed and reformed, not even if the composer chose to repeat words or to employ fugal or other musical devices. Thanks to modern composers, we already possess many HYMN-TUNES to which this compound term is really applicable, for they are hymns wedded to appropriate tunes; while their number is increasing, it rests with congregations to take care that the knot which the musician has tied shall not be carelessly or ruthlessly undone.

But to return to the subject of our sketch. At certain of the larger chapels in the metropolis, Waite opened simultaneous classes, each course comprising six lectures and lessons in psalmody. The only printed book used was a small selection of church tunes from his "Hallelujah"—a tune book in which the notes had the seven numerals printed underneath the stave, on a principle the same as that upon which we employ the *sol-fa* initials, "1" corresponding to the key-note. No instruction book in the theory of music was employed in these classes, nor indeed was there what we should now term a "method," meaning thereby a progressive series of exercises and songs, combined with full directions and information for the guidance of teacher and pupil. There was, however, system and method, ingenuity and good sense, in Waite's teaching; and if he did not carry his pupils farther than the practice of simple psalmody, his teaching so far as it went, was excellent. Waite's method consisted, first, in creating and fostering in the minds of his audience an ardent love for singing and more especially for that kind which takes the form of good congregational psalmody, engrafting upon these a strong desire to acquire sight-singing skill. This his lectures were remarkably well fitted to accomplish; and when precept was followed by practice in the shape of a well-planned and well-taught lesson, the result was invariably satisfactory both to teacher and pupil. Neither was Waite behind as regards modern teaching processes, as, for example, teaching by pattern, which was his almost invariable custom; and if he did not make use of time-names, he employed a device of similar nature, causing his pupils to divide into crotchets all the minims and longer notes of a tune.

Among the novelties which Waite introduced and popularized was the habit of singing with expression—altering the *tempo* and the degree of power so as to adapt the music to the changing sentiment of the words—a thing at that time quite new to congregational psalmody: he it was also who started in the chapels of London the now almost universal practice of *chanting*—an innovation which, on account of existing sectarian prejudices, did not fail to encounter opposition. Waite, however, argued

that while the hymn tune permitted a congregation to utter God's thoughts in man's words, the chant did more, for it enabled us to sing God's thoughts in his own very words. Then, having proved that the chant was a good and useful thing, and having also taken care to show that it was congregationally a possible thing, he proceeded to combat the prejudices of his hearers by the further argument that, if the chant was a good and useful and possible thing to Nonconformists, the *fact of its adoption by Episcopalians* ought not to deter the former from employing it—a line of reasoning incontrovertible, certainly, but which draws a somewhat gloomy picture of the relations which existed between the Church and Chapel of thirty years ago. In fact, their want of harmony, and indeed downright antagonism, occasionally displayed itself in a very amusing way in the course of the campaign which Waite began: the following is an instance. At a then well-known and well-attended City chapel in the metropolis, a psalmody movement, the result of Waite's labours, was commenced, and at the opening meeting a selection of tunes, chants, and simple anthems was rendered by a very excellent choir. During the evening a minister of some suburban chapel, who had certain strong musical prejudices, having been called upon to address the meeting, took occasion to congratulate the audience upon the success of their efforts after good psalmody, and more especially upon the fact that it was the result of congregational efforts, and not those of a surpliced choir—an institution which he, for one, was bound to denounce, etc., etc. Notwithstanding pretty audible expressions of disapproval, the speaker proceeded; but on resuming his seat became painfully aware that his remarks were pitched in the wrong key, upon which discovery he effected a rapid strategical movement and disappeared. It then leaked out that the singers consisted of some of the men and boy choristers of St. Paul's Cathedral assisted by the Chapel choir, and the liberality of the former in coming forward to help at a Nonconformist demonstration contrasted so favourably with the narrowness displayed by the speaker, that if the vote of the congregation had been taken there and then the zeal of the converts to the "new views" might have led them to condone any ecclesiastical innovationw hatever, whether surpliced or otherwise. Thus the resistance to improvement shown in certain quarters, trhough the violence of its own efforts, sometimes became really helpful to the cause of musical progress

[*To be continued.*

# The Quaver,

**February 1st, 1880.**

WITH this number is issued a small instalment of a new elementary work, the music of which will occupy two threepenny parts of 16 pages: it is intended to meet the requirements of those teachers who, having used the "Graduated Course" for eighteen consecutive winters, are now asking for an alternative work. Some teachers, when they have a book to their mind, prefer to keep to it, simply because they are thoroughly at home with it: others like to have a choice, and to them the new work will, it is hoped, prove useful.

A slight alteration is made in the mode of applying the *sol-fa* initials: this occupies rather more space, but as the initials are in this case gradually withdrawn, the arrangement keeps the notes uniform from the outset to the end. On a former occasion we pointed out that letter-note was susceptible of much variety, and this is one of the ways in which it can be varied—whether to advantage or otherwise, teachers must decide.

Teachers who may have any suggestions to offer will oblige by forwarding them to the Author, at 20, Paternoster Row, London, E.C.



### *TO CORRESPONDENTS.*

*Write legibly—Write concisely—Write impartially.*

*Reports of Concerts, Notices of Classes, etc., should reach us by the 15th of each month.*

*The name and address of the Sender must accompany all Correspondence.*

## The Quaver Composition Classes.

A new postal class, for beginners, will commence the study of Harmony on the 1st of July next.

All communications to be addressed:—

*The Secretary of The Quaver Composition Classes,*
*47, Lismore Road London, N.W.*

THE QUAVER is published on the 1st of every month. Price One Penny, including from four to eight pages of music printed either in Letter-note or ordinary notation. Post free for twelve months,—one copy 1s. 6d., two copies 2s. 6d.

# The Human Vocal System.

By "Vox Humana."

## Preface.

THE design of the following brief articles on Vocal Music is:—

1st, to *analyse and systematize* vocal truths.

2nd, to *name* these simply and aptly, while not ignoring the established and well-known vocal technicalities.

3rd, to *deduce* from true physiological and acoustic data three Voice-training Theories as a scientific abstract of all vocal phenomena.

First.—The theory of *Voice Triunity*, viz., that the human voice is essentially and demonstrably *triune* in its physiological and acoustic basis and formation, having *three different resounding cavities* and consequently *three different resoundings*, and being itself the *unition* of these resoundings.

Second.—The theory of the *Entire Longitudinal, with variable latitudinal-degree vibration of the vocal cords*, viz., that in the strictly natural or scientifically-trained voice the *pitch* of every sound is generated and regulated by the vibration of the vocal cords in their *unrestricted length-in-tension;* while the *force* of every sound is generated and regulated by the vibration of the vocal cords in their different *breadth-degrees-in-tension* for every additional air-power-degree impinged on them, from pianissimo to fortissimo.

That all the phenomena of voicing consist simply of *voice-strokes*, *springs*, and *glides*—names which literally describe the only musical and normal actions of the vocal cords and voice-cavities while speaking or singing.

Third.—The theory of *Scale Triformity and Triunity*, viz., that the One Musical Scale of Nature is essentially and literally an *acoustic and harmonic ladder*, the "sounds or tones" and "intervenient degrees" of which may be justly and aptly illustrated by the "steps" and "spaces" of an optic ladder as a perfect pictorial analogue. That it is also theoretically and practically *triform* and *triune*, being intuitively accepted and recognised as such by the universal musical ear.

That being necessarily variable in its form, though absolutely fixed in its size, it embodies within its vibrational and acoustic range (the limits of which are determined by the *vibrations of any given sound halved or doubled*) every possible harmonic interval and musical sequence the human ear can appreciate, or the human vocal organs correctly intonate.

That the so-called "Diatonic," "Chromatic," and "Enharmonic" Scales are simply the One Musical Ladder in *three forms*, each differing from the other only in the number of its "steps" and "spaces," but all exactly of the same *size*.

Or, in other words, the One Acoustic and Harmonic Ladder of Nature in its full-toned and completed form contains twenty-two steps and twenty-one intervals, all of which may be represented to the eye by *lines* and *spaces*, heard by the ear as *interval strokes*, *springs*, and *glides*, justly intonated by the *tension-degrees* of the vocal cords, and conventionally called the "enharmonic scale." When, however, thirteen steps and twelve intervals of the enharmonic form are used, we talk of the "ascending and descending chromatic scale," but when only eight steps and seven intervals (popularly known as the "octave") are used, we then recognise the familiar "diatonic scale"—the first and foundational scale-form of all melody and harmony. There is, however, only One Musical Ladder, the "size" and "forms" of which are absolutely determined by the ear, and intonated by the interval-strokes of the voice, with mathematical precision. It can never be *enlarged nor shortened*. The so-called "octave" or "replicate" is its first or last step, whatever may be the position in which it may be placed. It is ever the same in *vibrational and acoustic magnitude*. But like as an optic ladder may be raised or lowered to any practical *visible* height or depth, so may it also be raised or lowered to any practical *audible* height or depth, according to the will and ability of its user.

As it is admitted that the musical nomenclature is already too complex and abstruse, the Writer will give to every technical word or phrase used its simple English equivalent.

By the understanding and timely practice of the voice-training principles advocated, any voice may be developed to the utmost compass, flexibility, and power of which it is naturally capable.

## Three Voice Apparatuses.

All wind-instruments possess three totally distinct yet thoroughly systematized mechanical apparatuses in order to the production of musical sound, viz., Air-producers, Air-vibrators or Sound-generators, and Sound-resonators or Reflectors.

Precisely is it so with the mechanism of the Human Vocal System. The Lungs are the bellows or air-producers; the chordæ vocales by their wonderful and unique action are the

strings, reeds, pipes or keys, or air-vibrators and sound-generators; while the pharyngeal nasal, and oral cavities, balanced and united by the uvula, form one Grand Voice Concavity in which the sounds already generated in the larynx, and already resonated by the three voice-cavities, are simultaneously *consonated* in perfect balance and unity.

The human vocal system, therefore, viewed as a complete musical wind-instrument, consists of an air-apparatus, a vibrative-apparatus, and a resounding apparatus, so adjusted and conjoined as to produce those "triune sounds" we call "vowels" or the "human voice."

Hence the simple constituents of voicing are:—

1st, Air (breath)—the one motive element—the *primum mobile* of all speech and song.

2nd, Vibration—the wonderful immediate generator of sound and pitch in an instant of time.

3rd, Resonance (or reflection: resounding, *i.e.*, *additional sympathetic vibration*)—the cavities of which, by their varied "forms" and "sizes," produce every possible vowel-sound of human language, from the smallest oval to the largest circular. Besides form and size, vowels have quality, pitch, and force. They obtain their *form* and *size* from the different configurations of the oral cavity; their *quality*, from the more or less delicate and refined elasticity of the *red lining* (mucous membrane) of the vibrators and resonant cavities which produce them: their *pitch*, from the different tension-degrees of the vocal cords; and their *force* (or loudness) from the different *air-power degrees* of the lungs impinged on the relative *breadth and thickness degrees* of the vocal cords while vibrating unrestrictedly throughout their entire length.

*Vowel form* and *size*, therefore, depend upon the oral cavity; *quality*, upon the sound-resonator; *pitch*, upon the sound-generator; and *force*, upon the air-producer. [*To be continued.*

SUCH of our readers as are familiar with Smart's compositions will feel pleasure in learning that a biography of this eminent musician is now in preparation by Dr. Spark, to whose competent pen the public are also indebted for a short sketch of Smart's career which was reprinted in this and other journals.

Dr. Spark is at present collecting material for the work in progress, and has forwarded us the following circular letter, with the request in which all who can supply noteworthy information will doubtless gladly comply.

### HENRY SMART'S BIOGRAPHY.

TO THE EDITOR OF "THE QUAVER."

SIR,—May I be permitted through your columns to say that I have now collected what I think may be deemed the chief points of interest in the late composer's early career, up to the time when he was appointed organist of St. Philip's Church, Regent Street, London; and that any information of Smart's musical doings, &c., likely to be of use in my account of him, no matter how roughly given, will be gratefully accepted and acknowledged by me.

This opportunity may be taken to express my obligations to the numerous publishers who have so kindly and generously sent me copies of nearly all the known works of Smart, and from these I have been enabled to compile a catalogue which will prove most interesting and useful to those—and their name is legion—who regard my late lamented friend as one of the greatest English composers.

Faithfully yours,
WM. SPARK.

Brook House, Apperley,
near Leeds, Jan. 1st, 1880.

## Notes of Interrogation.

7. What is the literal meaning and recognised musical application of the word "diapason?"

8. Should there not be 15 steps and 14 intervals in the ascending and descending chromatic scales, rather than 13 steps and 12 intervals, thereby carrying out the principle of adding sharps and flats to all the notes of the diatonic scale, instead of 5 only?

9. Is not the descending chromatic scale by flats different from the ascending chromatic scale by sharps, when intonated by a stringed instrument or voice? If so, are they not really two different scales?

J.W.

## Recent Wonders of Sound.

BY W. H. PREECE.

*Delivered at the Christmas Lectures of The Society of Arts, London.*

I HAVE not brought you together to astonish you with new inventions, or to excite your wonderment at some of the advances that have been made of recent years. My principle object is to let every boy and girl who has honoured me with his or her presence this evening, see the advantages to be gained by knowing how to use his or her eyes and hands.

All advances of science are the result of experiment, and experiment is the simple mode by which new facts are brought to our knowledge. A great physician, some hundred years ago or more, lived in the town of Derby, and he was the grandfather of a very great man, who lives now, Mr. Charles Darwin. This old doctor said, that, "a fool is a man who never tried an experiment in his life." I am quite sure that there is scarcely a boy in this room who does not, every day of his life, try an experiment of some kind or other, and therefore there is no fool among my hearers. Every boy has, at some time or other, taken a paper bag, such as the one in my hand, and after blowing it out has burst it between his hands with the view of startling his little sister, or raising a smile from the cook. When he has done this, he has performed an experiment; but it is one thing to experiment, and another thing to draw a

lesson from such experiment; and it is towards the endeavour to exercise your thought, by carrying your minds from the natural effect to its cause that I am more anxious to lead you than to anything else. For instance, every boy, as I say, has made an experiment; but has anyone asked himself why it is that clapping one's hands, blowing a whistle, or making a sound in this way (bursting the bag), produces the effect on the brain that is called sound? When the bag is blown out to its full size, and forcibly compressed, there is a condensation of air in it, and then by the bursting of the bag, an expansion, and then by this sudden expansion, a disturbance of the air about us is produced, which has resulted in something being done between you and me. If I take this pop-gun and force dawn the handle rapidly, you hear by the report I have produced a disturbance in the air. Between that pop-gun and every ear in this room there has been a sudden vibration produced. We all know that when a clap of thunder is heard the windows shake; when, in church, the deep notes of the organ are sounded one can feel the pew vibrate; and those of you who in future years may travel to such places as the Falls of Niagara, will find that in the neighbourhood of the enormous roar of this water there is heard an incessant and constant vibration ot doors and window sashes. Hence, when we have sound, we must have as a source of production, a sudden disturbance of air. There must be a medium to convey these vibrations, and that medium is the air itself. To appreciate sound, or know when it is produced, there is something to receive it, and that medium is the organ of the ear. It follows then that sound and vibrations are concomitant, or similar, things. To convey these vibrations to the ear, they are received by the air in which we live, and move, and have our being. This air forms an enormous ocean 50 miles deep, and we are nothing bnt crabs and lobsters crawling at the bottom of it. This air swathes our bodies, and when it is thrown into vibration, it affects our ears, and this effect is what is called sound. What is this air? We cannot see it. We sometimes feel it, especially latterly, during the heavy gales and wind that have prevailed. Birds fly in it. It maintains the lights before us burning, and keeps us alive. We know that this air is composed of atoms and molecules. We will take no notice of the atoms, but will fix our minds on the molecules or clusters of atoms of which the air is composed. This room is the receptacle of more millions upon millions of these molecules than I could count if I were to keep on till to-morrow morning. Every little molecule of air is thrown into motion when sounds are produced, and every motion I make with my lips, and every sound I utter by such motion, strikes your ears, and produces the sound of my voice. To give you an idea how this is done, I have upon this board arranged a series or row of marbles. I have no doubt most of you are acquainted with that highly scientific apparatus, a marble, and have frequently experimented with it in various ways. That row of marbles represents a row of the molecules of the air that exist between my mouth and your ears, and when I take a marble from the right hand end of the row, and let it fall back into its position again, you will see that almost instantaneously the marble at the end of the left hand side of the row leaves its position and falls back again. If I take two marbles from the right hand and let them fall back, you will notice that two at the left hand are driven off, and so on. So with the molecules of air. Every time I utter a sound the molecules near my mouth are disturbed, and a similar disturbance takes place in your ear. You will see that the action through the row of marbles takes very little time indeed, but with the molecules of air the time taken to produce these movements is perfectly well-known, and the movements are easily measured. The velocity, or time that a sound takes to travel through the air is about 1,100 feet per second. I say "about," because it varies with the temperature. On those bright, brisk days, a short time ago, when we all enjoyed our skating, sound travelled at the rate of about 1,000 feet per second. On those hot, muggy, uncomfortable days, like yesterday, sound travelled about 1,100 feet per second. In water, sound travels very much quicker, being at the rate of 5,000 feet a second. With wood it is quicker still, being about 16,000 feet per second. So that the velocity with which sound passes through different media is simply dependent upon the character of the medium, and the ease with which the molecules composing it transmit each other's motion. Bearing in mind the fact that sound travels at the rate of 1,100 feet per second, you can all try an experiment the next time you hear thunder. Lightning travels at a rate which is practically infinite; it is, in reality 186,000 miles a second, but it is so fast that you may regard it as instantaneous, and, therefore, the moment you see the flash you know it has just taken place. Sound, travelling at the rate of 1,100 feet per second, takes about 4½ seconds to travel a mile. So that, having seen the flash, if you count 1, 2, 3, 4, 5, and so on (representing seconds) till you hear the thunder, then if it occurs on your counting five, you know that the storm is a mile away, and you can put your head beneath the clothes and be perfectly easy. If, on the other hand, you see the lightning, and the crash follows immediately after, it is very near. But there is one thing very certain, that, having heard the crash, you are all right, for the lightning which caused it has passed away. The speed with which sound travels is the cause of having such things as echoes. Echoes are simply due to the reflection of sound. From the far end of the room, every sound I utter is reflected back to me, but, because the distance is so short, I do not hear any difference between one syllable and another. But if the wall were 1,100 feet away, or rather half that distance, then at the end of each second I should get back the sound that I utter. Hence, it happens that in large halls it is extremely difficult to speak, because the echoes are so confusing. In the Albert-hall, for instance, there is a certain spot on the platform where poor unfortunate speakers stand, and, unless they are up to the secret they get confused in a series of sounds coming from all parts of the building. But when a speaker there knows what to expect, he regulates his voice, and the echo becomes a guide to him how to send his voice right away up to the ceiling. When I had the pleasure of lecturing there, I heard back every word that I uttered, and waited for it before I gave out a second, and the result was that I succeeded in filling the large area with my voice, though it is not naturally a very strong one.

The motion of these particles through the air is in itself an interesting study, but they are very complicated in their action. The nearest approach to the motion that I know of, to give you a mental picture of what takes place in the air, is the swaying of a field of barley. Many of you will remember how the gentle breezes blow the tips of the barley in extremely pretty waves, and the formation which these tips take is almost identically the same as that which the molecules of air take when transmitting sounds. In fact, if it were possible to illuminate this room, and to enable you to see the condition of the molecules of the air, you would see them very much as you see the top of a field of barley, excepting that, as the molecules are so small, you would require an infinitely powerful microscope to see them, whereas in the case of fields of barley you can exercise your own eyes.

Sounds are produced by the sudden expansion of air. Sounds being transmitted by this wonderful

strings, reeds, pipes or keys, or air-vibrators and sound-generators; while the pharyngeal nasal, and oral cavities, balanced and united by the uvula, form one Grand Voice Concavity in which the sounds already generated in the larynx, and already resonated by the three voice-cavities, are simultaneously *consonated* in perfect balance and unity.

The human vocal system, therefore, viewed as a complete musical wind-instrument, consists of an air-apparatus, a vibrative-apparatus, and a resounding apparatus, so adjusted and conjoined as to produce those "triune sounds" we call "vowels" or the "human voice."

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1st, Air (breath)—the one motive element—the *primum mobile* of all speech and song.

2nd, Vibration—the wonderful immediate generator of sound and pitch in an instant of time.

3rd, Resonance (or reflection: resounding, *i.e.*, *additional sympathetic vibration*)—the cavities of which, by their varied "forms" and "sizes," produce every possible vowel-sound of human language, from the smallest oval to the largest circular. Besides form and size, vowels have quality, pitch, and force. They obtain their *form* and *size* from the different configurations of the oral cavity; their *quality*, from the more or less delicate and refined elasticity of the *red lining* (mucous membrane) of the vibrators and resonant cavities which produce them: their *pitch*, from the different tension-degrees of the vocal cords; and their *force* (or loudness) from the different *air-power degrees* of the lungs impinged on the relative *breadth and thickness degrees* of the vocal cords while vibrating unrestrictedly throughout their entire length.

*Vowel form* and *size*, therefore, depend upon the oral cavity; *quality*, upon the sound-resonator; *pitch*, upon the sound-generator; and *force*, upon the air-producer. [*To be continued.*

SUCH of our readers as are familiar with Smart's compositions will feel pleasure in learning that a biography of this eminent musician is now in preparation by Dr. Spark, to whose competent pen the public are also indebted for a short sketch of Smart's career which was reprinted in this and other journals.

Dr. Spark is at present collecting material for the work in progress, and has forwarded us the following circular letter, with the request in which all who can supply noteworthy information will doubtless gladly comply.

### HENRY SMART'S BIOGRAPHY.

TO THE EDITOR OF "THE QUAVER."

SIR,—May I be permitted through your columns to say that I have now collected what I think may be deemed the chief points of interest in the late composer's early career, up to the time when he was appointed organist of St. Philip's Church, Regent Street, London; and that any information of Smart's musical doings, &c., likely to be of use in my account of him, no matter how roughly given, will be gratefully accepted and acknowledged by me.

This opportunity may be taken to express my obligations to the numerous publishers who have so kindly and generously sent me copies of nearly all the known works of Smart, and from these I have been enabled to compile a catalogue which will prove most interesting and useful to those—and their name is legion—who regard my late lamented friend as one of the greatest English composers.

Faithfully yours,
WM. SPARK.

Brook House, Apperley,
near Leeds, Jan. 1st, 1880.

## Notes of Interrogation.

7. What is the literal meaning and recognised musical application of the word "diapason?"

8. Should there not be 15 steps and 14 intervals in the ascending and descending chromatic scales, rather than 13 steps and 12 intervals, thereby carrying out the principle of adding sharps and flats to all the notes of the diatonic scale, instead of 5 only?

9. Is not the descending chromatic scale by flats different from the ascending chromatic scale by sharps, when intonated by a stringed instrument or voice? If so, are they not really two different scales?

J.W.

## Recent Wonders of Sound.

BY W. H. PREECE.

*Delivered at the Christmas Lectures of The Society of Arts, London.*

I HAVE not brought you together to astonish you with new inventions, or to excite your wonderment at some of the advances that have been made of recent years. My principle object is to let every boy and girl who has honoured me with his or her presence this evening, see the advantages to be gained by knowing how to use his or her eyes and hands.

All advances of science are the result of experiment, and experiment is the simple mode by which new facts are brought to our knowledge. A great physician, some hundred years ago or more, lived in the town of Derby, and he was the grandfather of a very great man, who lives now, Mr. Charles Darwin. This old doctor said, that, "a fool is a man who never tried an experiment in his life." I am quite sure that there is scarcely a boy in this room who does not, every day of his life, try an experiment of some kind or other, and therefore there is no fool among my hearers. Every boy has, at some time or other, taken a paper bag, such as the one in my hand, and after blowing it out has burst it between his hands with the view of startling his little sister, or raising a smile from the cook. When he has done this, he has performed an experiment; but it is one thing to experiment, and another thing to draw a

lesson from such experiment; and it is towards the endeavour to exercise your thought, by carrying your minds from the natural effect to its cause that I am more anxious to lead you than to anything else. For instance, every boy, as I say, has made an experiment; but has anyone asked himself why it is that clapping one's hands, blowing a whistle, or making a sound in this way (bursting the bag), produces the effect on the brain that is called sound? When the bag is blown out to its full size, and forcibly compressed, there is a condensation of air in it, and then by the bursting of the bag, an expansion, and then by this sudden expansion, a disturbance of the air about us is produced, which has resulted in something being done between you and me. If I take this pop-gun and force dawn the handle rapidly, you hear by the report I have produced a disturbance in the air. Between that pop-gun and every ear in this room there has been a sudden vibration produced. We all know that when a clap of thunder is heard the windows shake; when, in church, the deep notes of the organ are sounded one can feel the pew vibrate; and those of you who in future years may travel to such places as the Falls of Niagara, will find that in the neighbourhood of the enormous roar of this water there is heard an incessant and constant vibration of doors and window sashes. Hence, when we have sound, we must have as a source of production, a sudden disturbance of air. There must be a medium to convey these vibrations, and that medium is the air itself. To appreciate sound, or know when it is produced, there is something to receive it, and that medium is the organ of the ear. It follows then that sound and vibrations are concomitant, or similar, things. To convey these vibrations to the ear, they are received by the air in which we live, and move, and have our being. This air forms an enormous ocean 50 miles deep, and we are nothing bnt crabs and lobsters crawling at the bottom of it. This air swathes our bodies, and when it is thrown into vibration, it affects our ears, and this effect is what is called sound. What is this air? We cannot see it. We sometimes feel it, especially latterly, during the heavy gales and wind that have prevailed. Birds fly in it. It maintains the lights before us burning, and keeps us alive. We know that this air is composed of atoms and molecules. We will take no notice of the atoms, but will fix our minds on the molecules or clusters of atoms of which the air is composed. This room is the receptacle of more millions upon millions of these molecules than I could count if I were to keep on till to-morrow morning. Every little molecule of air is thrown into motion when sounds are produced, and every motion I make with my lips, and every sound I utter by such motion, strikes your ears, and produces the sound of my voice. To give you an idea how this is done, I have upon this board arranged a series or row of marbles. I have no doubt most of you are acquainted with that highly scientific apparatus, a marble, and have frequently experimented with it in various ways. That row of marbles represents a row of the molecules of the air that exist between my mouth and your ears, and when I take a marble from the right hand end of the row, and let it fall back into its position again, you will see that almost instantaneously the marble at the end of the left hand side of the row leaves its position and falls back again. If I take two marbles from the right hand and let them fall back, you will notice that two at the left hand are driven off, and so on. So with the molecules of air. Every time I utter a sound the molecules near my mouth are disturbed, and a similar disturbance takes place in your ear. You will see that the action through the row of marbles takes very little time indeed, but with the molecules of air the time taken to produce these movements is perfectly well-known, and the movements are easily measured. The velocity, or time that a sound takes to travel through the air is about 1,100 feet per second. I say "about," because it varies with the temperature. On those bright, brisk days, a short time ago, when we all enjoyed our skating, sound travelled at the rate of about 1,000 feet per second. On those hot, muggy, uncomfortable days, like yesterday, sound travelled about 1,100 feet per second. In water, sound travels very much quicker, being at the rate of 5,000 feet a second. With wood it is quicker still, being about 16,000 feet per second. So that the velocity with which sound passes through different media is simply dependent upon the character of the medium, and the ease with which the molecules composing it transmit each other's motion. Bearing in mind the fact that sound travels at the rate of 1,100 feet per second, you can all try an experiment the next time you hear thunder. Lightning travels at a rate which is practically infinite; it is, in reality 186,000 miles a second, but it is so fast that you may regard it as instantaneous, and, therefore, the moment you see the flash you know it has just taken place. Sound, travelling at the rate of 1,100 feet per second, takes about 4½ seconds to travel a mile. So that, having seen the flash, if you count 1, 2, 3, 4, 5, and so on (representing seconds) till you hear the thunder, then if it occurs on your counting five, you know that the storm is a mile away, and you can put your head beneath the clothes and be perfectly easy. If, on the other hand, you see the lightning, and the crash follows immediately after, it is very near. But there is one thing very certain, that, having heard the crash, you are all right, for the lightning which caused it has passed away. The speed with which sound travels is the cause of having such things as echoes. Echoes are simply due to the reflection of sound. From the far end of the room, every sound I utter is reflected back to me, but, because the distance is so short, I do not hear any difference between one syllable and another. But if the wall were 1,100 feet away, or rather half that distance, then at the end of each second I should get back the sound that I utter. Hence, it happens that in large halls it is extremely difficult to speak, because the echoes are so confusing. In the Albert-hall, for instance, there is a certain spot on the platform where poor unfortunate speakers stand, and, unless they are up to the secret they get confused in a series of sounds coming from all parts of the building. But when a speaker there knows what to expect, he regulates his voice, and the echo becomes a guide to him how to send his voice right away up to the ceiling. When I had the pleasure of lecturing there, I heard back every word that I uttered, and waited for it before I gave out a second, and the result was that I succeeded in filling the large area with my voice, though it is not naturally a very strong one.

The motion of these particles through the air is in itself an interesting study, but they are very complicated in their action. The nearest approach to the motion that I know of, to give you a mental picture of what takes place in the air, is the swaying of a field of barley. Many of you will remember how the gentle breezes blow the tips of the barley in extremely pretty waves, and the formation which these tips take is almost identically the same as that which the molecules of air take when transmitting sounds. In fact, if it were possible to illuminate this room, and to enable you to see the condition of the molecules of the air, you would see them very much as you see the top of a field of barley, excepting that, as the molecules are so small, you would require an infinitely powerful microscope to see them, whereas in the case of fields of barley you can exercise your own eyes.

Sounds are produced by the sudden expansion of air. Sounds being transmitted by this wonderful

material, air, we want something to receive the impacts —the movements—of these little molecules, and that is given to us by the ear. On the wall to my right you will see a diagram representing a section of the human ear. Here is the outside of the ear, the shape of which we all know so well. Then there is the inner tubing, and a little way inside this tubing is what we call the drum of the ear. This drum is in fact, a membrane, or disc (a small sized drumhead), which is hit by the molecules every time they are disturbed by the utterance of sound. The character, or nature of the sound is simply dependent upon the way in which it is struck by these little molecules. There is a wonderful and beautiful system of bones that take up these sounds from the drum of the ear, and transmits them to the nervous system, and then to the brain, but we have not to-night to trouble ourselves with what takes place beyond the drum of the ear itself, nor should I attempt to show you, for one very good reason, that I do not know myself, and I do not think that anyone has yet attempted to solve the mystery how it is that the motion of the molecules of the air is transmitted to the brain.

If anybody is anxious to know what sound is, there is a very simple experiment that you can all try. If I put my watch to your ear I hear the ticking of the watch through those molecules hitting the drum of my ear. If I place the watch in my mouth, so as not to let the teeth touch it, I hear nothing, but if I bite the watch, then the ticking comes out as clearly as when the watch is placed close to the drum of the ear, and in this instance the sound is transmitted to the brain, not through the drum of the ear, but through those complicated bones that support the drum and form part and parcel of the organ of hearing.

[*To be continued.*

## CORRESPONDENCE.

### VOICE REGISTERS.

*To the Editor of the "Quaver."*

Sir,—The facts and opinions which "Enquirer" has enunciated deserve careful examination, for they have a very practical bearing upon the teacher's art. The opinions advanced will, perhaps, clash with some commonly received notions: they may, nevertheless, have truth on their side, and for my part I quite agree with them.

The new names for old things and facts, which your correspondent animadverts upon, are not needed, and only tend to add to the confusion already existing. The terms "chest voice" and "head voice" are truthful enough, for they aptly describe the facts *as they appear to the singer himself;* and this, I hold, is the best way to describe them. Even if we were to employ terms which are physiologically true according to the science of to-day, the science of to-morrow might show them to be false; and in any case the friction of *use* would soon reduce them to tatters. Already the brand new terms are beginning to show rents: "thick register" and "thin register" may mean something provided the description is truthful, but when a man begins to talk about his "upper thick" and "lower thin," I conclude that the new nomenclature is made for look but not for wear.

Yours sincerely,
SCRUTATOR.

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*To the Editor of the "Quaver."*

Sir,—The matter of Voice Registers, discussed in your recent numbers, is one in which I am much interested: permit me therefore to contribute a few words upon the subject.

I think "Enquirer" is quite right in holding that there are no breaks—or should be none—in the male natural voice. The only "break" with which I am acquainted is the change from the natural voice to the falsetto, or *vice versa*.

On the other hand, I am inclined to think that a well trained falsetto is of some use, and has a certain value. To many a cathedral chorister, the falsetto is an important source of income, and many a singer who essays the tenor part would be quite unable to accomplish the work without the aid of his falsetto.

Further, the four different registers and qualities of voice, described as Soprano, Alto, Tenor, and Bass, are so few compared with the registers and qualities of the various instruments which form an orchestra, that I am inclined to ask,—can the composer afford to throw away the additional variety of voice which the falsetto provides, and is not its different quality an important factor in procuring the contrast and variety which he seeks?

Then, lastly, in almost all the Oratorios, except those of recent composers, the choruses have counter tenor rather than contralto, and it appears to me that for such music the part is best rendered by male and female voices intermixed.

Leaving the other points of the discussion to be dealt with by other discussers,

Respectfully yours,
A COUNTER TENOR.

## MONTHLY NOTES.

THE following were the more noteworthy performances of new, or revivals of old, choral compositions, during the last month. Prout's "Hereward," at the Crystal Palace. Smart's "Jacob," by the Highbury Philharmonic Society on Dec 15. Gade's "Crusaders" at Finchley, London, on Dec. 15, under the direction of Mr. R. Forsey Brion. Handel's "Semele," at the Bow and Bromley Institute, London, on Dec. 22. Gadsby's "The lord of the Isles," at Brixton, London, on Dec. 22 by Mr. Lemare's Choral Society.

A new weekly paper, "The London and Suburban Official Programme of Amusements" professes to give as complete a list of London indoor and outdoor recreations as the most omnivorous country cousin can desire.

The new "Holborn Town Hall," the site of which is the corner of what *was* "Liquorpond Street," Gray's Inn Road, London, was opened on Dec. 22nd with a concert under the direction of Mr. J. T. Hutchinson.

At Philadelphia, on November 26th and 27th, in the Permanent Exhibition Building, a grand Welsh Musical Festival was held, Mr. T. W. Mills presiding at the organ.

The Dundee Amateur Choral Union gave their first concert on Dec. 18th, at Kinnaird Hall: the programme included Cherubini's Requiem Mass in C minor, Mendelssohn's

"When Israel out of Egypt came" (CXIV. Psalm), and Schumann's "New Year's Song," were performed.

The Corporation of the City of London has authorized the expenditure of two hundred guineas towards the expenses of the Guildhall Orchestral Society for the season 1879—1880. The society consists of orchestral and vocal members, and has been established for the practice and performance of high class music in the city of London. The orchestral members meet on Monday evenings from 6.30 to 8.30 o'clock; the vocal members meet on Tuesday evenings, from 7 to 8.30 o'clock. Ladies and gentlemen desirous of joining the choir or orchestra may apply to the secretary. The entire musical arrangements are in the hands of Mr. Weist Hill, the conductor.

The Belfast Choral Association opened its fifth season (1879—80) with a grand harp festival on the 9th of January. Mr. John Cheshire and a number of eminent harpists from London and Dublin assisted, and Miss Agnes Larkcom, soprano, was principal vocalist; conductor, Mr. William J. Kempton.

Messrs. Patey & Willis have become the sole agents for supplying music dealers in London and the provinces with "the Academy Porte Musique" (Thomas's patent). This apparatus does not cause the music to be creased, it is self-closing, and moderate in price.

Messrs. Haines Brothers, of New York, are now making "sectional pianos" for travelling and export. The key-board and action form one section, and the wrest plank, iron frame, and strings the other. It is said the two sections can be readily taken apart and readjusted.

Messrs. Puttick & Simpson lately sold the autograph M.S. of Handel's opera "Amadigi," for £35 10s., and that of Mozart's Quintet in D major, 39 pp, for 43 guineas. They were from the collection of the late Mr. F. Smee, of the Bank of England.

*MUSIC RECEIVED.*

*The Fairy Queen Waltz—The Chit-Chat Polka*, which will receive notice in due course.

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"Retains the old notation in its entirety . . . . Contains more useful information on the subject than any similar work we have seen."—*Northern Warder.*

"Great pains have been taken in making this little work useful, as well for self-tuition as for the instruction of pupils in classes."—*Orchestra.*

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"A rich and economical fund of really good musical instruction."—*Yorkshire and Lincolnshire Advertiser.*

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As the sounds are obtained by dividing a string upon mathematical principles, they are strictly correct, and the Intonator may be used as a model for the voice. For this purpose it is greatly superior to the pianoforte, which only gives the sounds proximately. The Intonator also provides examples of sounds which are not to be found on the pianoforte, such as the difference between the sharp and the flat, also the acute and grave forms of several sounds; and as no skill is required to use it, the instrument is specially valuable for purposes of self-teaching.

The Intonator consists of a catgut string, stretched on a sound board or box. The string is raised at one end by resting on a *bridge*, and is attached to a peg, by means of which it may be raised or lowered in pitch. The sound is produced by twanging the string, after the manner of a guitar or harp, or by means of a bow, like a violin; the point on the string to be thus operated upon being about an inch from the bridge. The various sounds of the scale are produced by *stopping* the string at certain points, so as to permit a longer or shorter portion to vibrate. For this purpose *frets* are placed underneath the string, and the operation consists in pressing down the string until it comes into firm contact with the required fret, when the sound is to be drawn out in either of the ways explained above.

The frets are labelled with the sol-fa syllables or their initials, or with the numerals 1 to 7: thus DO, or 1, corresponds to the key-note,—RE, or 2, to the second degree of the scale,—MI, or 3, to the third degree, etc., and this rule applies quite irrespective of the pitch at which the string may be for the time being, for the string performs alike in all keys, and the sounds always remain *relatively* the same. All keys are, therefore, "natural" upon the Intonator, and the operations of pitching the key, or transposing to another key, consist simply in tightening or slackening the string (by means of the peg) to the required pitch. The pitch of the string can be altered as much as an octave, giving the power of playing in all keys; and on these improved Intonators, by a simple contrivance, provision is made for playing in two or more natural keys *without altering the pitch of the string*. The chromatic sharps or flats, or both, are given on all the Intonators.

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*The Intonators without sound box are mounted on solid wood: the tone is weak, but sufficient for self-training.*

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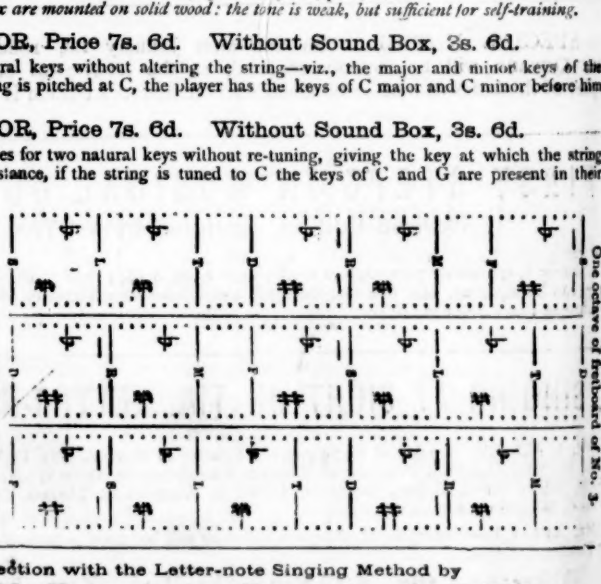
No. 1 provides for two natural keys without altering the string—viz., the major and minor keys of the same tonic: for example, if the string is pitched at C, the player has the keys of C major and C minor before him in their natural form.

### No. 2 INTONATOR, Price 7s. 6d. Without Sound Box, 3s. 6d.

No. 2, in like manner, provides for two natural keys without re-tuning, giving the key at which the string is set and that a fifth higher: for instance, if the string is tuned to C the keys of C and G are present in their natural form.

### No. 3 INTONATOR, Price 10s.

No. 3 provides for three natural keys without altering the string—viz., the key at which the string is pitched, with those a fourth and a fifth higher, as, for example, the keys of C, F, and G: a sliding fretboard permits either of the columns to be brought under the string. All the chromatic sharps and flats are given in each column; the short frets to the extreme right, in each column, being the sharps; and those to the extreme left, the flats.

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